

ABSTRACT OF THE DISCLOSURE

A charged particle beam exposure system comprising: a charged particle beam emitting device which generates charged particle beams with which a substrate is irradiated, the charged particle beam emitting device generating the charged particle beams at an accelerating voltage which is lower than that at which an influence of a proximity effect occurs; an illumination optical system which adjusts a beam diameter of the charged particle beams so that density of the charged particle beams is uniform; an character aperture in which an aperture hole is formed in a shape corresponding to a desired pattern to be written; a first deflector which deflects the charged particle beams by an electrostatic field that the charged particle beams have a desired sectional shape and travel towards a desired aperture hole and which returns the charged particle beams passing through the aperture hole to an optical axis thereof; a reducing projecting optical system which forms a multi-pole lens field so that the charged particle beams passing through the character aperture substantially reduce at the same demagnification both in X and Y directions when the optical axis extends in Z directions and form an image on the substrate without forming any crossover between the character aperture and the substrate; and a second deflector which deflects the charged particle beams passing through the character aperture by means of an electrostatic field to scan the substrate with the charged particle beams.